

Post-fire Spring Tortoise Surveys within the RC



Acknowledgments:

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USFWS: Garrett Sisson



Photo by M. Schiif

Overview:

1. Wildfire history in RC
2. Preliminary results of 2021 spring surveys
3. Summary and next steps





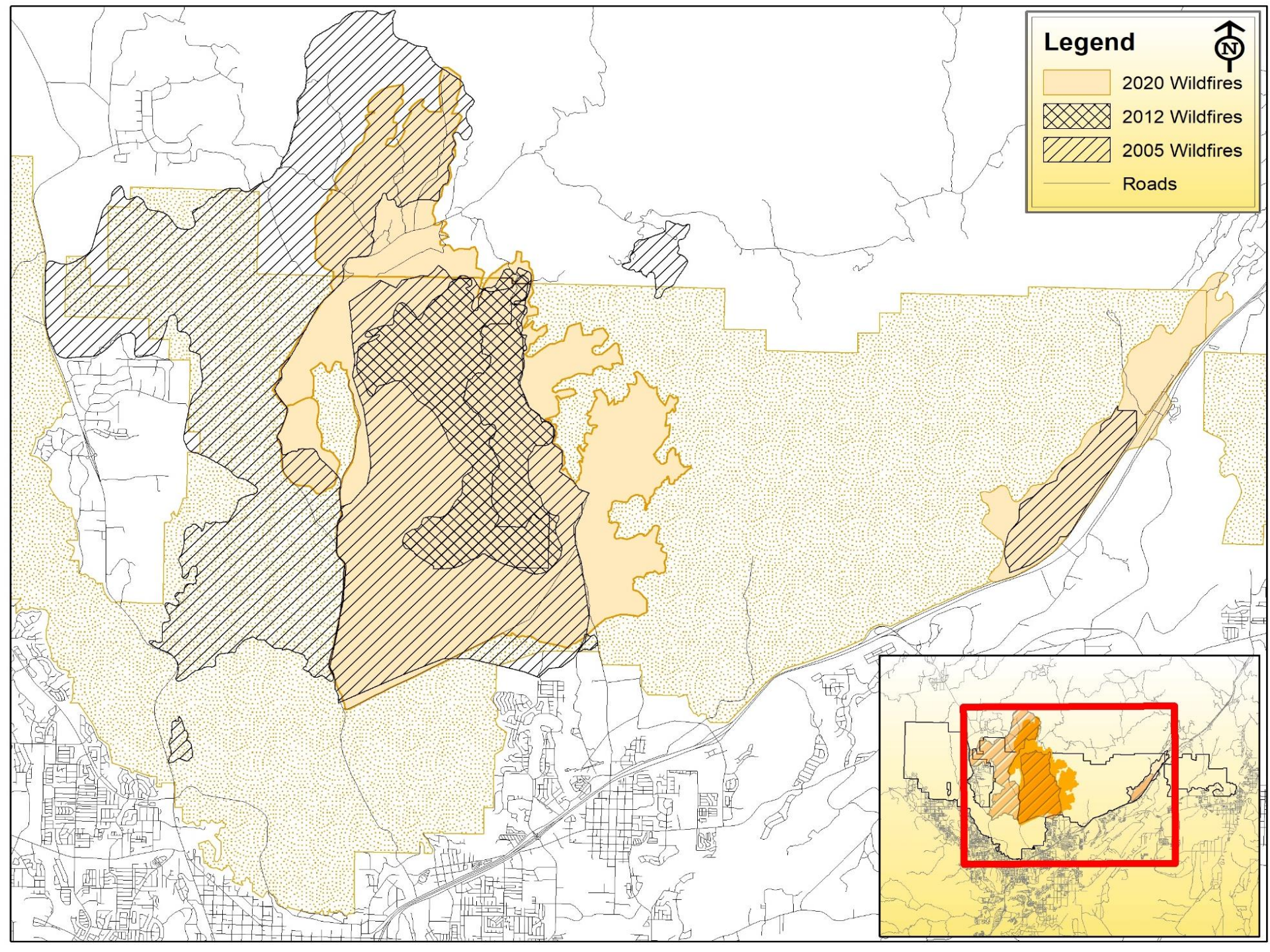
Wildfire History in RCDR/RCNCA

| Year | Fires in RCDR/RCNCA | Size (ac) | New Burn | Reburn |
|------|---|-----------|----------|--------|
| 1993 | Mill Creek | 2,248 | 100 % | 0 % |
| 1998 | Turkey Farm 1, Turkey Farm 2 | 506 | 100 % | 0 % |
| 2005 | Plateau, Mill Creek, SR-18, Tortoise, Red Cliffs | 14,624 | ~81 % | 19% |
| 2012 | Reserve, Quail | 4,228 | ~27 % | 73 % |
| 2020 | Turkey Farm Rd, Cottonwood Trail, Lava Ridge, Buckskin Hollow, Volcano, Snow Canyon | 12,842 | ~35 % | 65% |

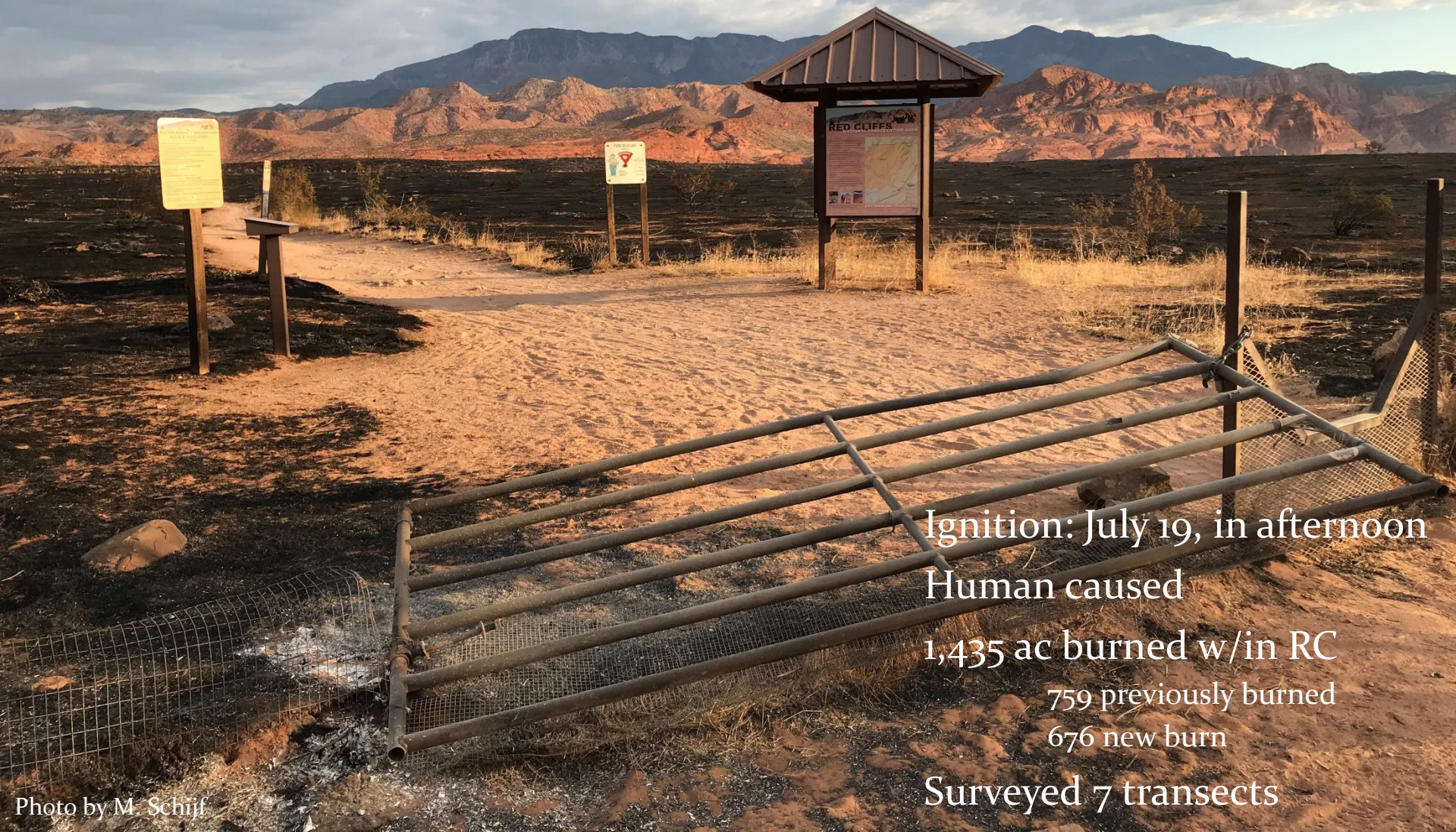
Legend



- 2020 Wildfires
- 2012 Wildfires
- 2005 Wildfires
- Roads



Cottonwood Trail Fire



Ignition: July 19, in afternoon

Human caused

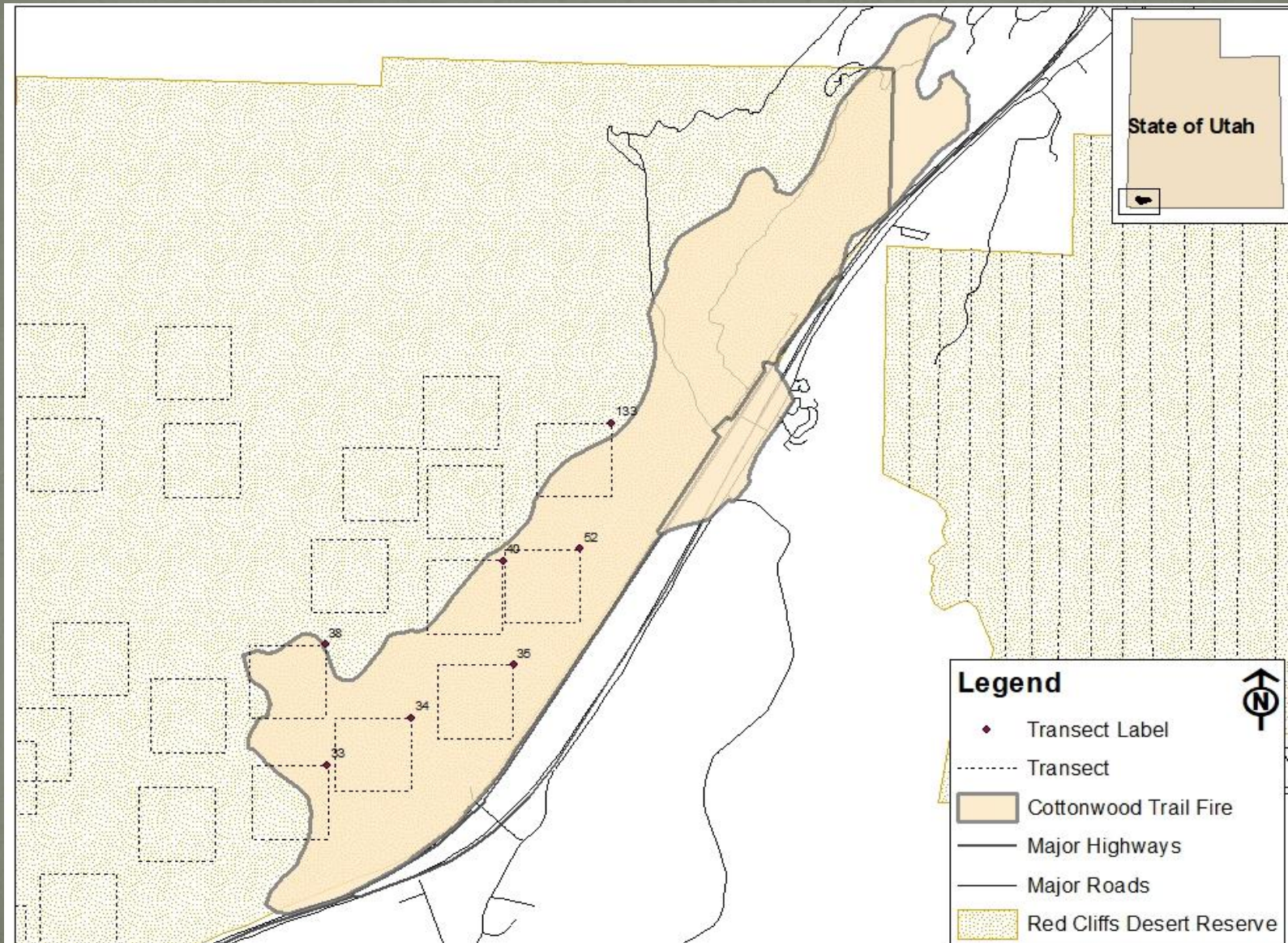
1,435 ac burned w/in RC

759 previously burned

676 new burn

Surveyed 7 transects

Cottonwood Trail Fire: 7 transects

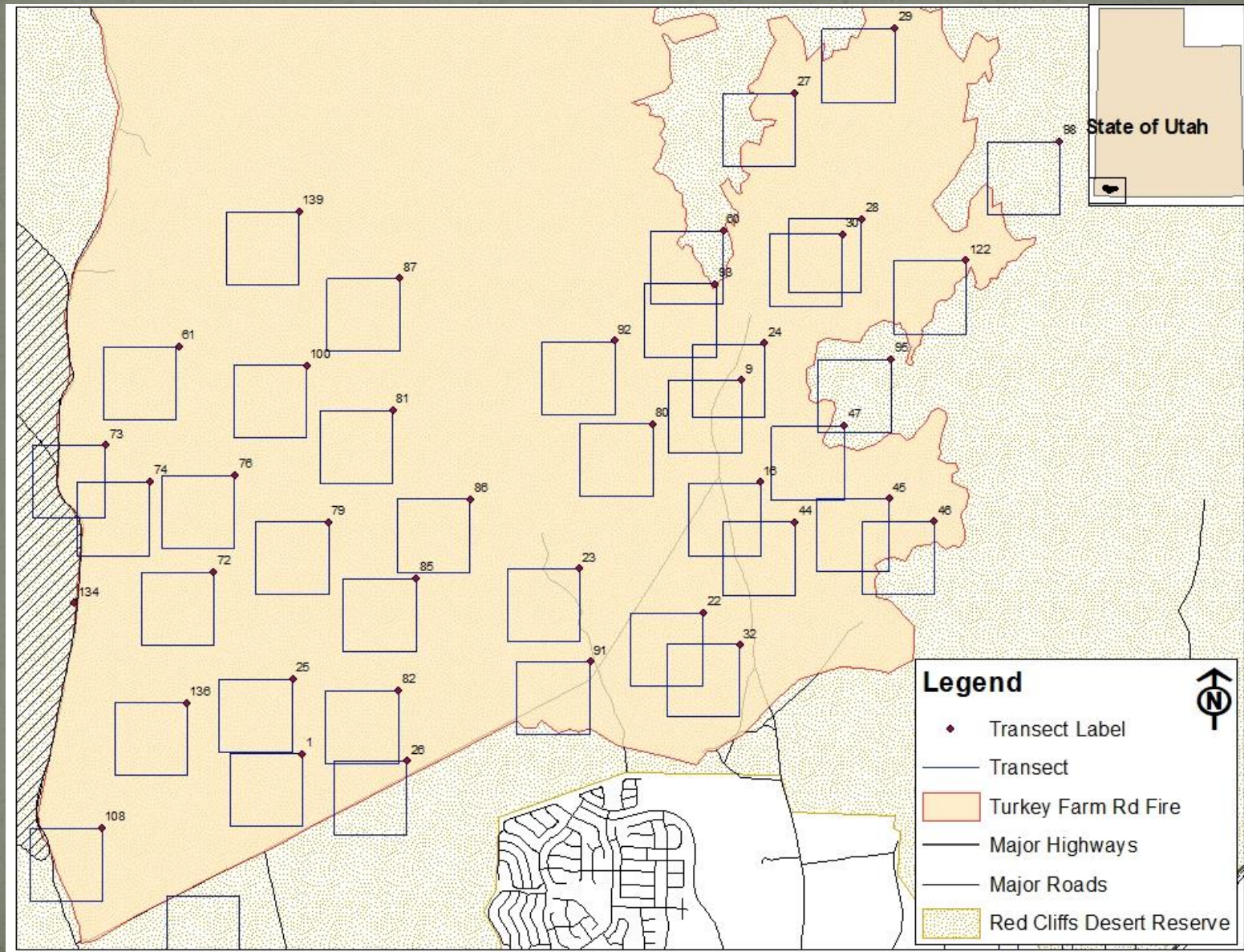




Turkey Farm Road Fire

- Ignition: July 13, in evening
- Cause: illegal fireworks
- 10,018 ac burned w/in RCDR
 - 7,528 previously burned
 - 2,490 new burn
- Surveyed 38 transects

Turkey Farm Road Fire: 38 transects





Field Effort

- 45 transects completed
- Transects lengths:
1.23-2.00 km
- 88.30 km surveyed
- Surveys completed
over 42 work days

Transects surveyed from April 9, 2021 to June 4, 2021



Results:

43 unique tortoises were observed during surveys

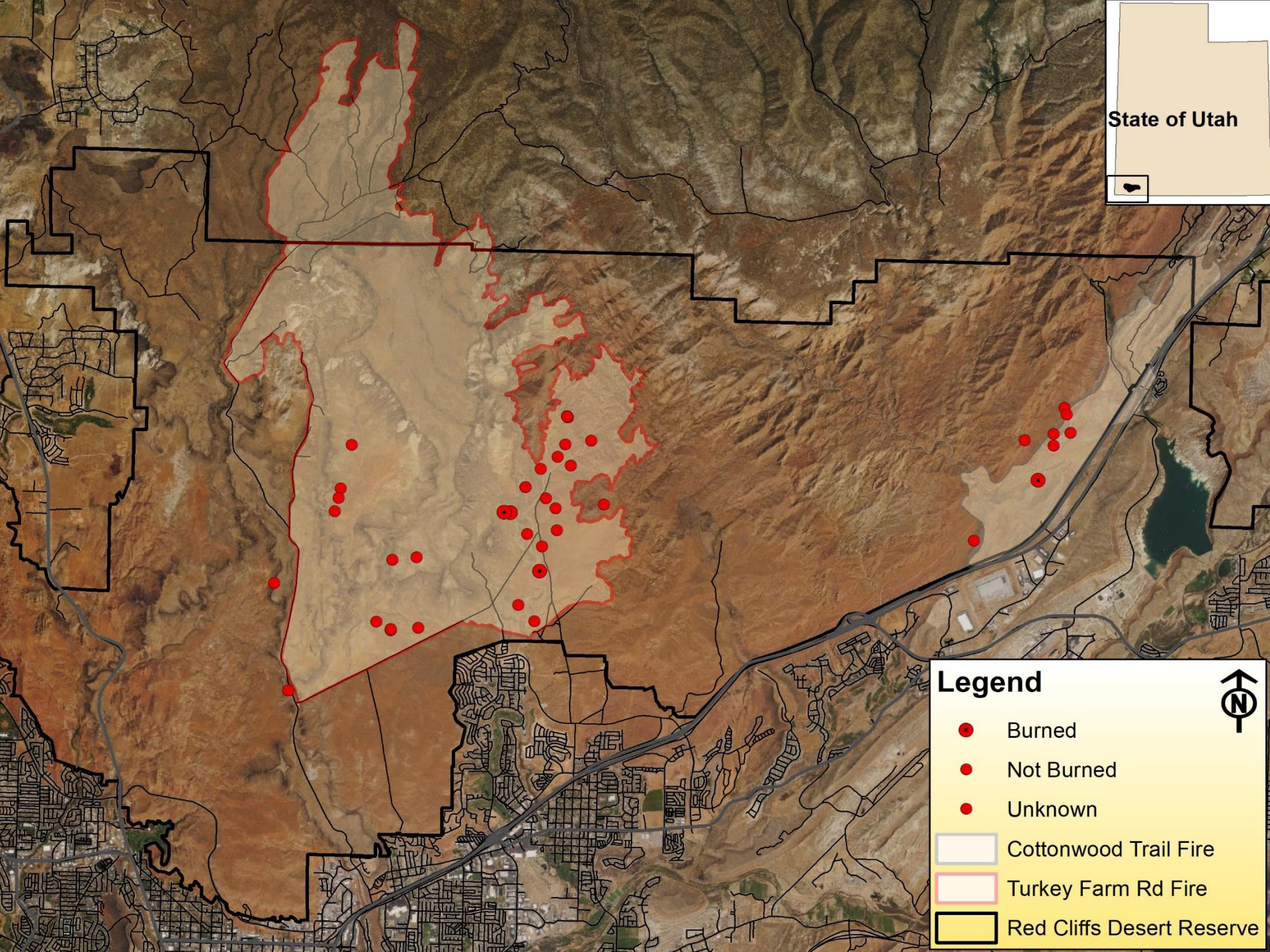
37 adults, 5 immatures, 1 juvenile

14% were juv/immature tortoises (< 180 mm in length)

10% of tortoises had burn injuries ($n=4$)

1 Cottonwood Trail Fire; 3 Turkey Farm Rd Fire





State of Utah

Legend

- Burned
- Not Burned
- Unknown

- Cottonwood Trail Fire
- Turkey Farm Rd Fire
- ▬ Red Cliffs Desert Reserve

Burn Injuries



- Burned forelimbs, hind limbs and tail
- Scute laminae peeling, melted, misshapen carapace
- Burns covering > 50% of carapace
- Bone exposed



Fire Injured Tortoise



Photo by J. Kellam



Photo by T. Papadopoulos

Kellam, J.O., A.M. McLuckie, E.J. Hartwig, and D.T. Papadopoulos. *In Press*. Mojave Desert Tortoise (*Gopherus agassizii*) Mortality and Injury Following the Cottonwood Trail Fire in Red Cliffs National Conservation Area, Utah. *Southwest Naturalist*.

URTD Clinical Signs: 9% of processed tortoises



- Moist/wet nares with exudate present
- Nares completely impacted & occluded
- Labored breathing (wheezing)
- Open abscess on deformed face

Shell Remains

16 Shells observed: 5 males, 6 females, 4 juveniles



Result Summary



| Fire Name | Transects | Total Surveyed | Live | Encounter Rate | Shells |
|------------------|-----------|----------------|------|----------------|--------|
| Cottonwood Trail | 7 | 14.00 | 8 | 0.57 | 2 |
| Turkey Farm Rd | 38 | 74.30 | 35 | 0.47 | 14 |

Direct Mortality:

- Contact with flames, incineration
- Exposure to lethal temperatures
- Asphyxiation
- Gas intoxication

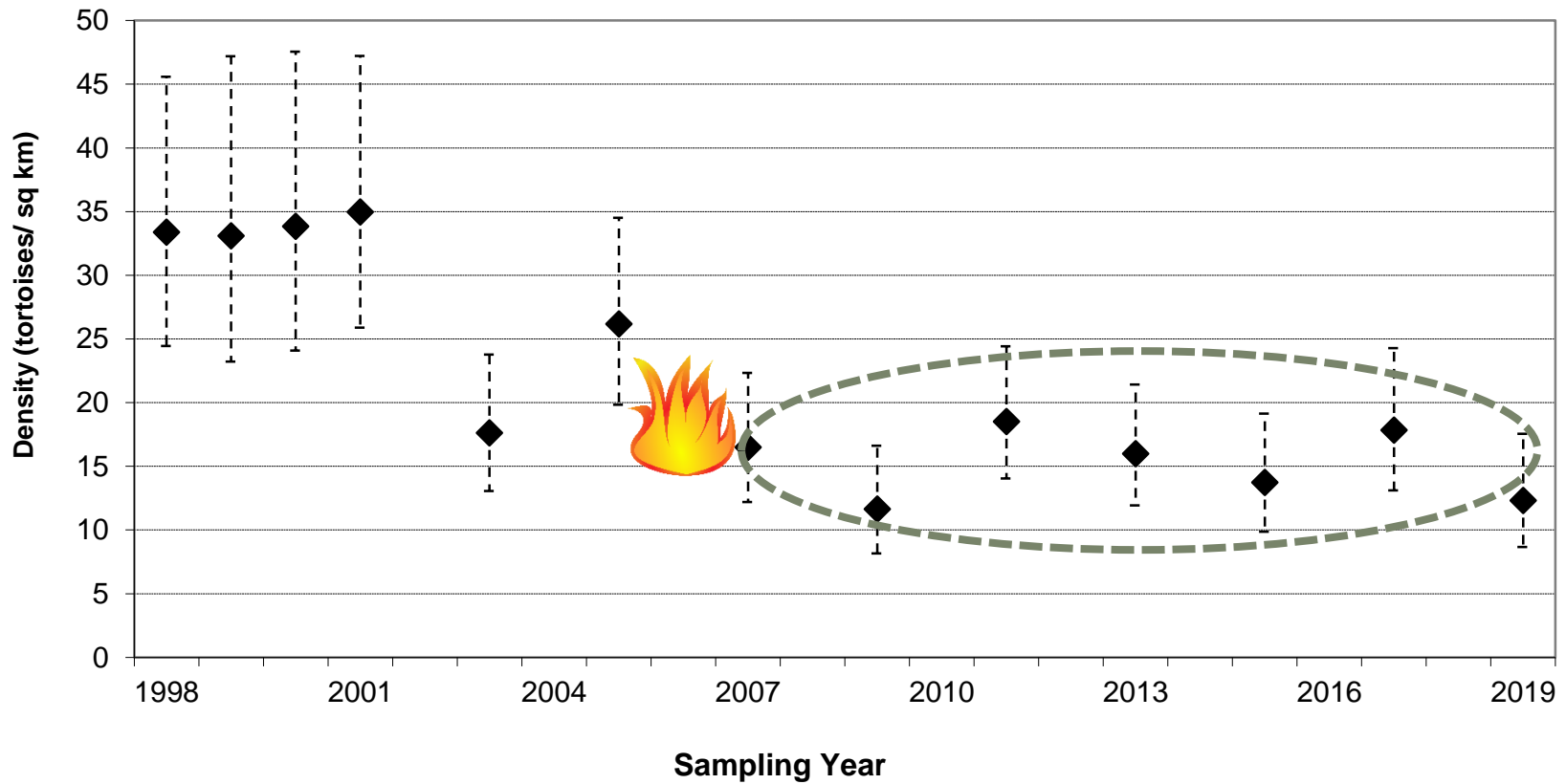


Latent Impacts from Fire:

- Long term injuries from exposure to hot temperatures
- Poor quality habitat, low forage diversity
- Higher surface temperatures due to loss of cover and shelter sites
- Exposure to predators



Population Density (adults)



Wildfire Mortality Variable



- 0% mortality for the Mill Creek fire in 1993 (Esque et al., 2003)
- 10% mortality for tortoise population in Utah, outside RC (Nussear et al., 2012)
- 11% mortality reported at Saguaro National Monument (Esque et al., 2003)
- 15-16 % mortality reported for during the 2005 and 2020 wildfires within RCDR
- Mortality impacted by: fuel load, fire intensity, population density, topography, time of day, weather (precipitation), tortoise behavior

Summary

- Tortoise can survive fires if in deep burrows and not on the surface.
- Exposure to fires can directly kill tortoises; long term veg impacts can make it difficult for tortoise populations to recover.
- We are seeing a 5-8 yr fire cycle within the Red Cliffs.
- Fires can significantly impact tortoise populations causing regional and local declines of 15-16%



Next steps.....

- Estimate tortoise densities in burned habitat
- Finalize monitoring report on fire impacts, direct and latent
- Work with agency partners to continue to restore habitat & protect unburned habitat
- Focus on removing exotic grasses like cheatgrass (e.g., Plateau, Esplanade)

